

What is claimed is:

1. An intermittent coating apparatus comprising:
a nozzle which applies a paint to a base material; and
intermittent means which repeats feeding and stopping of said paint to said nozzle as well as discharge and stopping of said paint to a return side,
wherein
said intermittent means stops the discharge of the paint to said return side after starting the feeding of the paint to said nozzle, at least at the time of starting the coating.
2. The intermittent coating apparatus according to claim 1, wherein
a timing to start the feeding of the paint to said nozzle is earlier than a timing to stop the discharge of the paint to said return side within a range of not shorter than 5 msec and not longer than 500 msec.
3. The intermittent coating apparatus according to claim 1, wherein
a timing to start the feeding of the paint to said nozzle is earlier than a timing to stop the discharge of the paint to said return side within a range of not shorter than 5 msec and not longer than 100 msec.
4. The intermittent coating apparatus according to claim 1, wherein
said intermittent means performs operations by using a two-way valve or a three-way valve.
5. The intermittent coating apparatus according to claim 2, wherein
said intermittent means performs operations by using a two-way valve or a three-way valve.
6. The intermittent coating apparatus according to claim 3, wherein
said intermittent means performs operations by using a two-way valve

or a three-way valve.

7. An intermittent coating apparatus comprising:
a nozzle which applies a paint to a base material; and
intermittent means which repeats feeding and stopping of said paint to
said nozzle as well as discharge and stopping of said paint to a return side,
wherein

said intermittent means starts the discharge of the paint to said return
side after stopping the feeding of the paint to said nozzle, at least at the time
of ending the coating.

8. The intermittent coating apparatus according to claim 7, wherein
a timing to stop the feeding of the paint to said nozzle is earlier than a
timing to start the discharge of the paint to said return side within a range of
not shorter than 0 msec and not longer than 100 msec.

9. The intermittent coating apparatus according to claim 1, further
comprising,

paint returning means which repeats operations to suck said paint out
of said nozzle and to return the paint into the nozzle, wherein

said paint returning means returns the paint into the nozzle at a
timing to start the feeding of the paint to said nozzle at the coating start
time, and sucks the paint out of the nozzle at a timing of the stop of the
feeding of the paint to said nozzle.

10. The intermittent coating apparatus according to claim 7, further
comprising,

paint returning means which repeats operations to suck said paint out

54543
of said nozzle and to return the paint into the nozzle, wherein

said paint returning means returns the paint into the nozzle at a timing to start the feeding of the paint to said nozzle at the coating start time, and sucks the paint out of the nozzle at a timing of the stop of the feeding of the paint to said nozzle.

11. An intermittent coating apparatus comprising:

intermittent means which intermittently feeds a paint to a nozzle; and

paint returning means which repeats suction and return of said paint out of and into said nozzle,

wherein

the relation between an operation time A to suck said paint out of said nozzle and an operation time B to return said paint into said nozzle is in a relation of $A < B$.

12. The intermittent coating apparatus according to claim 9, wherein

the paint is sucked out of said nozzle in an amount of not smaller than 0.01 cc and not larger than 10 cc.

13. The intermittent coating apparatus according to claim 10, wherein

the paint is sucked out of said nozzle in an amount of not smaller than 0.01 cc and not larger than 10 cc.

14. The intermittent coating apparatus according to claim 11, wherein

the paint is sucked out of said nozzle in an amount of not smaller than 0.01 cc and not larger than 10 cc.

15. The intermittent coating apparatus according to claim 9, wherein

the paint is returned into said nozzle at a flow rate of not lower than 1 cc/msec.

5463
16. The intermittent coating apparatus according to claim 10, wherein the paint is returned into said nozzle at a flow rate of not lower than 1 cc/msec.

17. The intermittent coating apparatus according to claim 11, wherein the paint is returned into said nozzle at a flow rate of not lower than 1 cc/msec.

18. The intermittent coating apparatus according to claim 12, wherein the paint is returned into said nozzle at a flow rate of not lower than 1 cc/msec.

19. The intermittent coating apparatus according to claim 13, wherein the paint is returned into said nozzle at a flow rate of not lower than 1 cc/msec.

20. The intermittent coating apparatus according to claim 14, wherein the paint is returned into said nozzle at a flow rate of not lower than 1 cc/msec.

21. The intermittent coating apparatus according to claim 1, wherein the operations of said paint returning means are carried out by utilizing a piezoelectric element.

22. The intermittent coating apparatus according to claim 7, wherein

SUB A3
the operations of said paint returning means are carried out by utilizing a piezoelectric element.

23. The intermittent coating apparatus according to claim 11, wherein the operations of said paint returning means are carried out by utilizing a piezoelectric element.

24. An intermittent coating apparatus comprising: intermittent means which intermittently feeds a paint to a nozzle; and paint returning means which repeats suction and return of said paint out of and into said nozzle by making a bellowphragm disposed in said nozzle move up and down.

25. The intermittent coating apparatus according to claim 24, wherein the paint is sucked out of said nozzle in an amount of not smaller than 0.01 cc and not larger than 10 cc.

SUB A4
26. An intermittent coating apparatus comprising:
a nozzle which applies a paint to a base material; and
intermittent means which repeats feeding and stopping of said paint to said nozzle as well as discharge and stopping of said paint to a return side, wherein
said intermittent means comprises
a feeding side two-way valve which repeats the feeding of said paint to said nozzle and stop of the feeding,
a return side two-way valve which repeats the discharge of said paint to the return side,
a flow path through which said paint flows, and

control means which can independently control the operations of said feeding side two-way valve and said return side two-way valve.

27. The intermittent coating apparatus according to claim 26, wherein at least said return side two-way valve is configured with cutting off or opening said flow path by operating a piston and said piston is moved to close said flow path in a direction which is the same as that of a flow of said paint to said return side.

28. The intermittent coating apparatus according to claim 26, wherein a timing to switch said feeding side two-way valve is earlier than a timing to switch said return side two-way valve, at least a coating start time within a range of not shorter than 5 msec and not longer than 500 msec.

29. The intermittent coating apparatus according to claim 26, wherein a timing to switch said feeding side two-way valve is earlier than a timing to switch said return side two-way valve, at least a coating start time within a range of not shorter than 5 msec and not longer than 100 msec.

30. The intermittent coating apparatus according to claim 26, wherein the paint sucked out of said nozzle is in an amount of not smaller than 0.01 cc and not larger than 10 cc.

31. An intermittent coating apparatus comprising: a nozzle which applies a paint to a base material, intermittent means which repeats feeding and stopping of said paint to said nozzle as well as discharge and stopping of said paint to a return side, and

a mixer which is disposed in a flow path between said nozzle and

said intermittent means.

32. The intermittent coating apparatus according to claim 31, wherein said mixer has a length which is not shorter than 1 mm and not longer than 200 mm.

33. The intermittent coating apparatus according to claim 31, wherein said mixer has a diameter which is not shorter than 5 mm and not longer than 100 mm.

34. An intermittent coating method for intermittent coating by utilizing an intermittent coating apparatus comprising a nozzle which applies a paint to a base material and intermittent means which repeats feeding and stopping of said paint to said nozzle as well as discharge and stopping of said paint to a return side, wherein

said intermittent means stops the discharge of the paint to said return side after starting the feeding of the nozzle to said nozzle, at least a coating start time.

35. An intermittent coating method for intermittent coating by utilizing an intermittent coating apparatus comprising a nozzle which applies a paint to a base material and intermittent means which repeats feeding and stopping of said paint to said nozzle as well as discharge and stopping of said paint to a return side, wherein

said intermittent means starts the discharge of the paint to said return side after stopping feeding of the paint to said nozzle, at least at a coating end time.

36. An intermittent coating method for intermittent coating by utilizing an intermittent coating apparatus comprising intermittent means which intermittently feeds a paint to a nozzle and paint returning means which repeats suction and return of said paint out of and into said nozzle, wherein an operation time A to suck said paint out of said nozzle and an operation time B to return said paint into said nozzle are in a relation of $A < B$.

37. An intermittent coating method for intermittent coating by utilizing intermittent means which intermittently feeds a paint to a nozzle, wherein said method allows said paint to be sucked and returns out of and into said nozzle by moving up and down a bellowsphragm disposed in said nozzle.

38. An intermittent coating method for intermittent coating by utilizing an intermittent coating apparatus comprising a nozzle which applies a paint to a base material and intermittent means which repeats feeding and stopping of said paint to said nozzle as well as discharge and stopping of said paint to a return side, wherein

a feeding side two-way valve for repeating feeding of said paint to said nozzle and stop of the feeding and a return side two-way valve for repeating discharge of said paint to the return side and stop of the discharge which compose said intermittent means, are independently controlled.

39. An intermittent coating method for intermittent coating by utilizing an intermittent coating apparatus comprising a nozzle which applies a paint to a base material intermittent means which repeats feeding and stopping of said paint to said nozzle as well as discharge and stopping of said paint to a

return side and a mixer which is disposed in a flow path between said
nozzle and said intermittent means, wherein
a pressure loss is produced by said mixer.